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COUNTRY East Germany

REPORT

SUBJECT Development and Production of
Electronic Tubes and Diodes

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SOURCE EVALUATIONS ARE DEFINITIVE

list describing electronic tubes and
diodes produced in East Germany.

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ENCLOSURE ATTACHED
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SECRETDEVELOPMENT AND PRODUCTION OF ELECTRONIC TUBES AND DIODES

October/November 1958

2 silicon diodes (heavy duty)

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Use: for extra heavy-duty voltage rectifiers

Developed: for the NVA (National Peoples Army)

completed about Oct/Nov 1958

at VEB RFT Werk fuer Fernmeldewesen (OSW), Berlin-

Oberschoeneweide

Production: for the NVA, small series

Beginning Oct/Nov 1958

at VEB RFT Werk fuer Fernmeldewesen (OSW), Berlin-

Oberschoeneweide

model produced Nov 1958

Max peak inverse volts: 220 v

Max operating volts: 80 v with capacitive load

160 v with ohmic load

Max rectified current: 1.2 amp

Max peak forward current: 6 amp

Western equivalent type: similar to Internetal types OY 6042 and 6043

Remarks: The performance data of the model lie between those of the two equivalents. The max rectified current of the model and the peak forward current are, however, higher than in the equivalents. The dimensions of the equivalents have been duplicated approximately, the mechanical design of the model, however, is different and primitive in some places. The insulating disk of the Internetal types are of first-class mica; in the GDR types they are of synthetic-resin bonded-paper sheet (Hartpapier).

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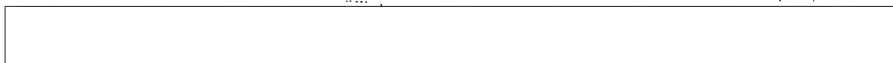
Further development: In Oct/Nov 58, work was in progress at VEB RFT Werk fuer Fernmeldewesen on the development of about 8 types of silicon diodes for operating voltages of 60-600 volts and inverse voltages of 70-750 v.



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Electronic Transmitter Tubes and Miniature Tubes

December 1958



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- ✓ 1. special subminiature tube ($U_a - 60 \text{ v}$)
- ✓ 2. special subminiature tube ($U_a - 80 \text{ v}$)
- ✓ 3. special miniature tube ($U_a - 72 \text{ v}$; $I_a - 3.5 \text{ ma}$)
- ✓ 4. special miniature tube ($U_a - 72 \text{ v}$; $I_a - 2 \text{ ma}$)
- ✓ 5. special miniature tube ($U_a - 52 \text{ v}$)
- ✓ 6. subminiature tube ($U_a - 100 \text{ v}$)
- ✓ 7. transmitter tube 829 B

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The color markings of the top of the tube gives the voltage class.

Two subminiature tubes, special, for use in oscillating circuits up to 1,200 Mc and in output stages up to 300 Mc of transmitters for the NVA (National Peoples Army).

Developed for NVA; development completed about November 1958 at VEB RFT Werk fuer Fernmeldewesen (OFW), Berlin-Oberschoenevalde

Production presumably for the NVA, beginning Nov/Dec 1958 at VEB RFT Werk fuer Fernmeldewesen, OFW, Berlin-Oberschoenevalde; model produced December 1958.

Technical data: U_f 1.3 v

I_f 60 ma

U_a 60 v

U_{g2} 60 v

U_{g1} -4.5 v

I_a 5 ma

S 0.7 ma/v

No known equivalent Western type.

The internal capacitances of the tube are especially low in order that the tube can be used for the largest possible frequency range.

25X1

Two special subminiature tubes for use in oscillator circuits up to 1,000 Mc or in output of driver stages up to 250 Mc of transmitters for the NVA.

Developed for the NVA about November 1958 by VEB RFT Werk fuer Fernmeldewesen (OSW), Berlin-Oberschoeneweide.

Production presumably for the NVA, beginning Nov/Dec 1958, by VEB RFT Werk fuer Fernmeldewesen. Model produced December 1958.

Technical data: U_f 1.3 v

U_{g1} -5.2 v

I_f 55 ma

I_a 9 ma

U_a 80 v

S 0.9 ma/v

U_{g2} 80 v

No known Western equivalent type.

25X1

Two special miniature tubes for use in two-way radiotelephone sets. Development by VEB RFT Werk fuer Fernmeldewesen (OSW), Berlin-

Oberschoeneweide; contractor and completion date of development not known.

Production by VEB RFT Werk fuer Fernmeldewesen for unknown contractor; delivery address to VEB RFT Funkwerk Koenpenick; model produced December 1958; production in small series.

Technical data: (limits)

U_f	1.3 v	U_{g1}	-9 v
I_f	50 ma	I_a	3.5 ma
U_a	72 v	S	0.7 ma/v
U_{g2}	72 v	N_a	350 mw

c_o 2.6 micromicrofarad

c_a 3.2 micromicrofarad

No known equivalent Western type.

Remarks: The sets in which the tubes are to be used operate on a wavelength of 1.5 meters (200 Mc), thus special emphasis was put on obtaining the lowest possible internal capacitance.

25X1

Two special miniature tubes for use in two-way radiotelephone sets.

Developed at VEB RFT Werk fuer Fernmeldewesen; production at VEB RFT Werk fuer Fernmeldewesen for unknown contractor; delivery to VEB RFT Funkwerk Koenpenick; production in small series, amount not known; model produced December 1958.

Technical data:	U_f	1.3 v	c_o	3.5 μ mf
	I_f	50 ma	c_a	4.5 μ mf
	U_a	72 v	c_{g1a}	0.008 μ mf
	U_{g2}	72 v		
	I_a	2 ma		
	S	1.3 ma/v		
	N_a	230 mw		

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Remarks: The sets in which the tubes are to be used operate on a wavelength of 1.5 meters (200 Mc) thus special emphasis during development was put on obtaining the lowest possible internal capacitance.

25X1

Two special miniature tubes for use in two-way radiotelephone sets.

Developed by VEB RFT Werk fuer Fernmeldewesen, Berlin-Oberschoeneweide.

Production by VEB RFT Werk fuer Fernmeldewesen for unknown contractor; delivery address: VEB RFT Funkwerk Kopenick; unknown amount of production, small series; model produced December 1955.

Technical data: U_f 1.3 v-
 I_f 100 ma
 U_a 52 v
 U_g^2 52 v
 I_a 3.2 ma
 S 2.3 ma/v
 N_a 530 mw
 c_e 4 micromicrofarad
 c_a 4.2 micromicrofarad
 c_{g1a} 0.008 micromicrofarad

No known equivalent Western type.

Remark: The sets in which the tubes are to be used operate on a wavelength of 1.5 meters (200 Mc) thus special emphasis during development was put on obtaining the lowest possible internal capacitance.

25X1

Two subminiature tubes for use as output pentode for portable vhf transmitter-receiver sets for the National Peoples Army.

Development on contract for the NVA, not yet concluded, at VEB RFT Werk fuer Fernmeldewesen.

Model produced December 1958, special manufacture for laboratory research and tests.

Technical data: U_f 1.3 v
 I_f 120 ma
 U_a 100 v
 U_g^2 100 v
 U_g^k -7 v
 I_a 12 ma
 S 2.2 ma/v
 N_a 1.0 w

A new type of subminiature series. The contractor insists on the delivery of tubes with these ratings.

25X1

Two transmitter tubes, 829/B, special manufacture for stationary and mobile transmitters of average and high output.

Developed at VEB RFT Werk fuer Fernmeldewesen, Berlin-Oberschoeneweide.
 (improvement)

Produced at VEB RFT Werk fuer Fernmeldewesen on contract for the NVA and for export. Model produced December 1958. Production in small series.

Technical data: max plate voltage 650 v
 negative control grid bias -130 v
 screen grid voltage 250 v
 heater voltage 6.3 v

Equivalent Western type: presumably an improved model of the USA army tube 829, used in mobile transmitters and obtained by the USSR through lend-lease.

Remarks: The transmitter tube deviates somewhat in performance ratings from the old model of the same designation and has different

electrodes and different anode cooling.

For the purpose of modulating the 829 B transmitter tube, the 6 SL 7 OT (octal series) driver tube is used together with it. This driver tube is given the same designation in the tube lists of the US armed forces, and has been copied for years by RFT Werk fuer Fernmeldewesen for export to the USSR. The East German tube deviates somewhat from the US tube with respect to electrical data.

In contrast to the US designs, the GDR tubes (829 B and 6 SL 7 OT, and other all-glass designs), the JAN type designation and manufacturer are not etched into the glass envelope, but in the ^{base} base.

Electrical Diodes and Transistors (RFT-Factories)

December 1958

(original model and descriptive material)

1. Universal diode ($-U_D = 100 \text{ v}$)
2. Universal diode ($-U_D = 105 \text{ v}$)
3. Special diode ($-U_D = 70 \text{ v}$)
4. Subminiature diode ($-U_D = 100 \text{ v}$)
5. Subminiature diode ($-U_D = 80 \text{ v}$)
6. Transistor
7. Special solder

Shifting of Development and Production of Transistors

In the fourth quarter of 1958, the shifting of the development and production of transistors to VEB RFT Funkwerk Koellada (Thuringia) began. Funkwerk Koellada is supposed to be the parent factory for transistor manufacture. Technical installations and equipment were shifted

from factories in the Berlin area to Koellada, and scientists and engineers have been transferred there also.

These measures are based on the fact that the production of important semiconductor components had to be removed from the Berlin area because of the tense political situation of Berlin. It is possible that this is only a pretext for purposes of propaganda designed to make the people involved amenable to the move. (Generally, the people engaged in this work rebel at the idea of leaving the Berlin area.)

The professional people of VEB RFT Funkwerk Berlin-Koepenick work closely together with Funkwerk Koellada, since the laboratory tests on the manufactured products of Funkwerk Koellada are for the most part conducted at Funkwerk Koepenick.

New laboratory facilities are being built at VEB Funkwerk Koellada. The laboratory experiments there are still being conducted at 20 deg Cent room temperature in a machine testing shop, whereas international standards call for a room temperature of 25 deg Cent.

Development of a new portable two-way radiotelephone set

The development on this set was completed in December 1958 at VEB RFT Funkwerk Koepenick. The set is allegedly a copy, with several improvements, of the KL 9 set used in the West German Army.

The set is designed for carrying by hand or strapped on the back ("knapsack-suitcase" design). It operates on a wavelength of 1.5 meters, has a completely transistorized power pack, and uses 10 channels (the KL 9 set uses only 3 channels.).

Descriptive Material on Technical Details

Two universal diodes; developed at VEB Funkwerk Koellada; production at VEB RFT Funkwerk Koellada; and...

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production at VEB RFT Funkwerk Koellada; model produced Dec 1958.

Technical data: $-U_D$ 100 v

$-U_{DM}$ 120 v

ID ($-U_D$ at 0 v) 60 ma

ID ($-u_{DM}$ max) 18 ma

i_{DM} 160 ma

i_{st} 600 ma

A universal all-glass diode, the strays of which are still quite large.

25X1

Two universal diodes; developed at VEB RFT Funkwerk Koellada;

production at VEB RFT Funkwerk Koellada; model produced Dec 1958.

Technical data: $-U_D$ 105 v

$-U_{DM}$ 140 v

ID ($-U_D$ at 0 v) 55 ma

ID ($-u_{DM}$ max) 18 ma

i_{DM} 160 ma

i_{st} 550 ma

All-glass design.

25X1

Two special diodes; developed at VEB RFT Funkwerk Koellada;

production at VEB RFT Funkwerk Koellada; models produced Dec 1958;

production in small series.

Technical data: $-U_D$ 70 v

$-U_{DM}$ 100 v

ID ($-U_D$ at 0 v) 40 ma

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JD ($-u_{DM \max}$)	15 ma
i_{DM}	160 ma
i_{st}	230 ma

The special diode works as an electrical switch.

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The subminiature diodes (all-glass) used in small portable vhf transmitter-receiver sets, and possibly for control head (Steuerkopf) of special devices.

Developed presumably for the NVA (National Peoples Army) at VEB RFT Funkwerk Koellada; production in small series (about 85-95% rejects) begun presumably Nov/Dec 1958 at VEB RFT Funkwerk Koellada; models produced December 1958.

Technical data: $-U_D$ 100 v
 $-U_{DM}$ 120 v
 JD ($-U_D$ at 0 v) 60 ma
 JD ($-u_{DM \max}$) 18 ma
 i_{DM} 160 ma
 i_{st} 600 ma

Remarks: The subminiature diode in all-glass design has the same limiting data as the universal diode described in Annex 1. For the manufacture of the subminiature diode, first-class material is used according to especially observed manufacturing methods. The requirement of the same performance as that of the universal diode, with the smallest dimensions, explains the high number of rejects.

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Two subminiature diodes for use in small portable short-wave (vhf) transmitter-receiver sets, primarily in ratio-detector circuits.

Developed presumably for the NVA; developed at VEB RFT Funkwerk Koellada.

Production begun presumably NOV/Dec 1958 at VEB RFT Funkwerk Koellada; model produced December 1958, small series.

Technical data: $-U_D$ 80 v

$-U_{DM}$ 110 v

JD ($-U_D$ at 0 v) 40 ma

JD ($-U_{DM}$ max) 12 ma

i_{TM} 120 ma

i_{st} 400 ma

Equivalent Western type: OA 85 (with different dimensions and mechanical design)

Remarks: Silicon diodes of the same type for a temperature range of minus 60 to plus 150 deg Cent were in development at VEB RFT Funkwerk Koellada in December 1958.

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One transistor (with high amplification factor) for use in an audio-frequency amplifier in A- or B-circuit, and in silicon rectifier circuits. (Gleichspannungswandler-Schaltungen).

Development for AFT (Office of Technology), began presumably mid 1958 at: either VEB RFT Rostock, Rostock, or

VEB RFT- Werk Erfurt, or

VEB RFT Funkwerk Koellada.

Production also at one of the three above plants; production model

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made presumably in December 1958, small series.

Technical data: U_c 8 v

U_{cp} 16 v

J_c 2,000 ma

J_e 2,000 ma

N_c 6,000 ma

T_u max plus 45 deg Cent
(as voltage rectifier)

Equivalent Western type: presumably TKD GFT 2006

Remarks: The transistor was tested at the laboratory of
VEB RFT Funkwerk Koepenick for the NVA (National Peoples Army),
but it was not produced there.

25X1

One material sample of special solder for soldering connections
to semiconductor components.

Development finished in 1958 at VEB RFT Funkwerk Koepenick, on
contract for VEB RFT Funkwerk Koepenick.

Production begun 1958 on contract for VEB RFT Funkwerk Koepenick.

Technical data: especially sensitive to heat, flows at only 150 deg
[Centigrade], with high strength and otherwise good properties.

Equivalent Western type: on hand.

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